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ORIGINAL ARTICLE

Knowledge and Practice of Cervical Cancer Prevention amongst Undergraduates of the Delta State University, Abraka, Nigeria

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Keywords
Attitude,
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ABSTRACT

Background: In Nigeria, approximately 26 women die daily due to cervical cancer. About 90% of cervical cancer cases are caused by human papillomavirus infection (HPV), transmitted through sexual intercourse and can be prevented. This study assessed knowledge of cervical cancer and practice of its preventive measures, among undergraduates in a University in South-South Nigeria.

Material and Methods: his study was a descriptive cross-sectional survey conducted among 479 students of the Delta State University (DELSU), Abraka, Nigeria. Respondents were selected across Faculties through a multistage sampling technique and data was collected using a pretested self-administered structured questionnaire. Data analysis was done using Statistical Package for Social Science version 23 with statistical significance set at $p<0.05$.

Results: The mean age of the respondents was 20.4 (±2.4) years. The majority of the respondents (85.0%) had a poor level of knowledge of cervical cancer and its prevention methods. Age ($p<0.001$), study level ($P<0.001$), and faculty (<0.001) were significantly associated with knowledge of cervical cancer and its prevention. About 59.0% of respondents have an overall positive attitude towards cervical cancer and its prevention. The level of uptake of cervical cancer screening and HPV vaccination was 0.8% and 1.3% respectively, however, more than half of the respondents were willing to get screened (63.9%) and vaccinated (50.9%).

Conclusion: The institution should organize and sponsor comprehensive health education programmes about cervical cancer and its prevention. Provision of screening and vaccination at subsidized rates or at no cost will provide widespread coverage of prevention both in local communities and among students.

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INTRODUCTION

Cervical cancer is regarded as a disease of public health importance, being the fourth most frequent cancer globally after breast, colorectal, and lung cancer. It is one of the world's leading causes of morbidity and mortality among women. [1-2] In Nigeria, approximately 26 women die daily due to cervical cancer; and it is second only to breast cancer as the most common cancer among women in Nigeria.[3] Cervical cancer is primarily caused by the pathogenic organism, human papillomavirus (HPV), which is transmitted through sexual intercourse.[3] However, not all persons with HPV infection

develop cervical cancer.[4] Risk factors for developing cervical cancer include; HIV, genetic factors, smoking, multiple sexual partners, weak immune system, uncircumcision in males, and early sexual debut.[5] Typically, cervical cancer is asymptomatic at its early stage, however, as it progresses, it presents with various symptoms which may include; post-coital bleeding or abnormal vaginal bleeding. Pelvic pain and offensive vaginal discharge are associated with the late stages of the disease. It is, nevertheless, one of the most avoidable types of female cancer. Early screening for cervical cancer and HPV vaccination are integral for the prevention of cervical cancer.[2]

The health belief model was created to explain why some people take specific steps to prevent illness while others do not. It enables researchers to understand better and forecast how individuals will behave concerning their health, and how also they will adhere to healthcare interventions. These individuals perceive they are susceptible to developing cervical cancer and other illnesses. They are also aware of the consequences of contracting this disease (perceived seriousness) and are also aware it's significant enough to avoid it by practicing cervical cancer preventive measures.[6] Thus, this study was carried out to assess university students' knowledge and attitudes towards cervical cancer and its preventive measures. Also, this study assessed the uptake of cervical cancer screening and vaccination among university students.

MATERIALS AND METHODS

This study was conducted among 479 students at Delta State University (DELSU), Abraka in Delta State using a descriptive cross-sectional design. In this study, a minimum of 361 sample size was calculated using the Cochran formula for descriptive studies.

Cochran sample size calculation

$n = Z^2 p (1-q)/d^2$

Where n = Minimum sample size, Z = confidence level, p = prevalence, approximate proportion of the event in the population, and d = margin of error.

Assuming the maximum variability equal to 50% (p=0.5), a 95% confidence level with a 5% margin of error and a prevalence of 24.8[7].

Z = 95% CI (1.96)

P= 24.8%, 0.248

q= 1-P, 1-0.248= 0.752

d= 5%, 0.05

$n= 1.96^2 X 0.248 X 0.752 / 0.05^2$

= 0.8204/0.0025

n= 328.16

10% attrition (non-response) = 10%, 0.1X 328 = 32.8

32.8+328 = 360.8

Minimum sample size =361

A multistage sampling technique was used for the selection of respondents.

Simple random sampling by balloting was used to select departments and levels, while participants were selected systematically, where every third student (the number 3 was allocated through balloting) was given a questionnaire.

Table 1: Socio-demographics characteristics of respondents (n = 479)

Variable	Frequency	Percentage
Age (in years)		
< 18	46	9.6
18 – 22	361	75.4
23 – 27	66	13.8
28 - 32	6	1.3
Mean Age	20.4 (±2.4)	
Gender		
Male	116	24.2
Female	363	75.7
Religion		
Christian	470	98.1
Muslim	6	1.3
Traditional worshipper	2	0.4
Others	1	0.2
Marital Status		
Single	470	98.1
Married	5	1.0
Others	4	0.8
Ethnic Group		
Urhobo	181	37.8
Igbo	137	28.6
Isoko	45	9.4
Ijaw	34	7.1
Itshekiri	21	4.4
Others	61	12.7
Faculty		
Basic Medical Sciences	98	20.5
Clinical Medicine	40	8.4
Management Sciences	42	8.8
Arts and Humanities	37	7.7
Agriculture	40	8.4
Education	54	11.3
Pharmacy	40	8.4
Science	53	11.1
Social Sciences	75	15.7
Level		
100	95	19.8
200	262	54.7
400	111	23.2
500	11	2.3
Residence of respondents		
School hostel	151	31.5
Off campus	328	68.5

Students aged 16 years and above were included, while all 300 level students were excluded; 300 level students were excluded as most departments were on their compulsory industrial training while others went for community-based experience and services (COBES) during data collection.

This study utilized a pretested self-administered structured questionnaire developed from

relevant literature that assessed their level of awareness, and knowledge on cervical cancer, HPV vaccination, and screening. The source of information, attitude towards preventive measures, level of participation in vaccination or screening practices and barriers to uptake of vaccination and screening were also assessed. Ten questions were used to assess knowledge of cervical cancer screening and vaccination; and each correct response (answer) was scored one, while incorrect or nil response (answer) was scored zero. Knowledge and attitude score were converted to percentages, and those who scored 50% and above were regarded to have good knowledge/positive attitude, while those who scored below 50% were regarded to have poor knowledge/negative attitude. Participants who had been vaccinated or screened at least once were considered to have good practice. Data was sorted, cleaned and analysed using SPSS, version 23 and presented as frequency tables and relevant descriptive statistics. Bivariate and multivariate analysis was also done with the significance level set at $P < 0.05$. Ethical approval (HREC/PAN/2022/046/0493) was obtained from the Health Research Ethics Committee (HREC), Delta State University Teaching Hospital, Oghara; written consent was obtained from participants stating confidentiality of information provided.

Table 2: Awareness of Cervical Cancer

Variable	Frequency	Percent
Aware of cervical cancer (n= 479)		
Yes	307	64.1
No	172	35.9
Source of information (n = 307)		
News/Media	156	50.8
Health talk/seminars	46	14.9
Lecturer	37	12.0
Family/Friends	34	11.0
Health institutions	28	9.1
Others	6	1.9

RESULTS

Table 1 shows the socio-demographic variables of 479 study respondents. A higher proportion of respondents were females 363 (75.7%), and males accounted for 24.2% (116) of the total study population. The mean age was 20.4 (±2.4) years and respondents were mainly Christians, 470 (98.1%), and single 470 (98.1%). The majority of respondents were of Urhobo ethnic group 181 (37.8%) and Igbo 137 (28.6). From the Nine Faculties represented in this study, most of the respondents 262 (54.7%) were in 200 level, followed by 400 level 111 (23.2%). Most respondents of this study lived off campus, 328 (68.5%). A total of 307 persons (64.1%) had heard of cervical cancer prior to this study, and the primary source of information was from news/media 156 (50.8%) **(Table 2).**

Most of these students, 289 (60.3%), do not know the cause of cervical cancer, 86 (18%) linked cervical cancer to a virus, while 82 (17.1%) knew that having multiple sexual partners is a risk factor for developing cancer of the cervix, 96 (20%) persons identified irregular vaginal bleeding as a cervical cancer symptom, and 80 (16.7%) participants knew foul-smelling vaginal discharge is a symptom. In comparison, 318 (66.4%) respondents do not know the symptoms of cervical cancer. In this study, 86 (18%) respondents identified screening as a cervical cancer prevention method, 100 (20.9%) and 73 (15.2%) respondents identified HPV vaccination and safe sexual practice as preventive methods respectively, while 286 (59.8%) participants do not know methods of cervical cancer prevention. Regarding knowledge of cervical cancer screening methods, only 84 (17%), 34 (7.1%) and 13 (2.7%) of the respondents knew of pap smear, biopsy and VIA respectively. About a third (139) of the respondents had heard of the human papillomavirus vaccine prior to this study, however, almost all study participants, 434 (90.6%), lacked knowledge of the various types of vaccines against the human papillomavirus, while only 37 (7.7%) and 16 (3.3%) of respondents identified Cervarix and Gardasil as HPV vaccines. **(Table 3).**

There was a statistically significant association ($p<0.001$) between the respondent's faculty and level of study with knowledge of cervical cancer and preventive measures. **(Table 4)**

Table 5 showed that 70.6% (338) of study participants believed screening helps detect cervical cancer early, and 183 (38.2%) persons agreed that everyone is at risk of contracting HPV. More than half of the respondents, 254 (53.0%), believe vaccination prevents cervical cancer. **Table 6** showed that the level of study and faculty of study were significant predictors of good knowledge of cervical cancer and its prevention methods. Only 6 (1.3%) participants had been vaccinated against cervical cancer and 3 (0.8%) female respondents had been screened at least once prior to the study. Reasons for non-uptake include lack of awareness, ignorance, financial constraint, restriction from a partner, and cultural/religious beliefs. **(Table 7)**

DISCUSSION

Even though more than three-fifth of the study participants had heard of cervical cancer, the level of awareness observed in this study is lower than the report of Idowu et al (67.0%)[8], Assoumou et al. (91.0%)[9] and higher than that of Akinola et al (47.0%)[10] and Ezem (52.8%).[11] The varying levels of awareness could be attributed to the educational background of the studied population. While this present study considered students, previous studies considered the women population generally. In this present study, the news/media was the most predominant source of information. This is consistent with a similar study conducted in Lagos State, Nigeria.[12]

Table 3: Knowledge of Cervical cancer and its prevention

Variable	Frequency	Percent
Causes of Cervical Cancer*		
Viral infection	86	18.0
Multiple sexual partners	82	17.1
Bacterial infection	74	15.4
Early sexual intercourse	56	11.7
Cigarette smoking	41	8.6
Don't know	289	60.3
Symptoms of Cervical Cancer*		
Irregular vaginal bleeding	96	20.0
Foul smell/vaginal discharge	80	16.7
Post coital bleeding	46	9.6
No symptom	11	2.3
Don't know	318	66.4
Persons at-risk		
Both gender	129	26.9
Females only	73	15.2
Males only	16	3.3
Don't know	261	54.5
Method (s) of Cervical Cancer Prevention*		
HPV Vaccination	100	20.9
Frequent Screening	86	18.0
Safe sexual practices	73	15.2
Mastectomy	13	2.7
Mammoplasty	6	1.3
Don't know	286	59.8
Method(s) of Screening*		
Pap smear	84	17.5
Biopsy	34	7.1
Visual inspection with acetic acid	13	2.7
Don't know	365	76.2
Heard of HPV vaccine		
Yes	139	29.0
No	340	70.9
HPV vaccine can be given to sexually active persons		
Yes	118	24.6
No	361	75.4
HPV vaccine is available in Nigeria.		
Yes	95	19.8
No	384	80.2
Category of people who can be vaccinated		
Both gender	136	28.4
Males only	43	9.0
Females only	36	7.5
Commercial sex workers	1	0.2
Don't know	263	54.9
The HPV vaccine(s)*		
Cervarix	37	7.7
Gardasil	16	3.3
Don't know	434	90.6

*Multiple response

Table 4: Association between socio-demographic characteristics of respondents and knowledge of cervical cancer

Variable	Knowledge of cervical cancer		χ^2	*p*-value
	Good (%)	Poor (%)		
Age (in years)				
<18	5 (10.9)	41 (89.1)	19.218	<0.001
18-22	46 (12.7(	315 (87.3)		
22-27	16 (24.2)	50 (75.8)		
28-32	4 (66.7)	2 (33.3)		
Gender				
Male	18 (15.3)	100 (84.7)	0.023	0.882
Female	53 (14.7)	308 (85.3)		
Religion				
Christian	68 (14.5)	402 (85.5)	8.033§	0.039
Muslim	1 (16.7)	5 (83.3)		
Traditional worshiper	2 (100.0)	0 (0.0)		
Others	0 (0.0)	1 (100.0)		
Marital Status				
Single	69 (14.7)	401 (85.3)	3.766§	0.129
Married	0 (0.0)	5 (100.0)		
Others	2 (50.0)	2 (50.0)		
Faculty				
Basic Medical Sciences	33 (33.7)	65 (66.3)	58.782	<0.001
Clinical Medicine	9 (22.5)	31 (77.5)		
Management Science	2 (4.8)	40 (95.2)		
Arts and Humanities	0 (0)	37 (100)		
Agriculture	5 (12.5)	35 (87.5)		
Education	1 (1.9)	53 (98.1)		
Pharmacy	11 (27.5)	29 (72.5)		
Science	7 (13.2)	46 (86.8)		
Social Science	3 (4.0)	72 (96.0)		
Level				
100	8 (8.4)	87 (91.6)	36.582	<0.001
200	25 (9.5)	237 (90.5)		
300	-	-		
400	33 (29.7)	78 (70.3)		
500	5 (45.5)	6 (55.5)		

Media being the predominant source of information could be attributed to the fact that the population used for this study were students in higher institutions who might have access to the internet and can readily access health-related information.

Despite the high level of awareness of cervical cancer in this study, less than one-fifth had good knowledge of cervical cancer and its preventive methods. This is similar to the report of Idowu et al. (11.0%),[8] and Ferdous et al (12.0%),[13] while on the contrary, a higher

proportion of good knowledge about cervical cancer has been reported among medical students in Nigeria and women in Cameroon by Isara et al. (60.0%),[14] and Tebeu et al. (28.0%),[15] respectively. Differences in the findings of this study compared to findings by Isara et al could be attributed to variation in the study population, as it was conducted among medical students. Notable areas where the study participants of this current study lacked knowledge of cervical cancer include the cause, symptoms of cervical cancer, persons at risk, and vaccination for the disease. Inadequate knowledge of cervical cancer symptoms has also been reported by Amu et al.[12] However, less than one-quarter of the respondents in this study were aware of cervical cancer screening and prevention methods.

Regarding factors associated with knowledge of Cervical Cancer, proportionally more of those between the ages of 23 – 30 years had good knowledge of cervical cancer compared to those below 23 years of age. There was a statistically significant association between age and knowledge of cervical cancer similar to findings reported by Oluwole et al. and Isara and Osayi. [16,17.]

There was also a statistically significant association between faculty of respondents and knowledge of cervical cancer, with proportionally more of those in Basic medical sciences, clinical medicine, and pharmacy having good knowledge when compared to respondents from other faculties. This is similar to a study carried out among University of Benin medical students where most respondents had good knowledge of cervical cancer and its prevention.[14] Oluwole et al.[16] also reported that the course of study is significantly associated with knowledge of HPV vaccine (0.003). In the same vein, a higher proportion of the respondents in 400 and 500 levels had good knowledge of cervical cancer when compared to those in 100 and 200 levels, and there was a statistically significant association between the level of study and knowledge of cervical cancer (<0.001). A similar report was given by Oluwole et al. and Isara and Osayi.[16,17] Significant predictors of good knowledge of cervical cancer and its prevention method in this study were the level of study and faculty of study.

In this present study, more than half of the respondents have a positive attitude towards cervical cancer prevention. This finding is similar to the study of Amu et al,[12,16] but contrary to the report of Al-Meer et al,[18] where participants were willing to be screened only if the procedure was painless and simple.

Though slightly above one-quarter of the respondents know of cervical screening methods and have heard cervical cancer vaccine, only 0.8% and 1.3% of the respondents had been screened and received the vaccine respectively. Major reasons proffered for not vaccinating/screening in this study include: "I'm healthy, I'm not informed where to get screened/vaccinated and never heard of it (lack of information)". Similarly, Ezenwa et al.[19], Mojahed et al.[20], and Oluwole et al.[16] reported a lack of information as the most common reason for non-uptake of HPV vaccine. Similarly, low

levels of uptake of cervical cancer screening and HPV have been reported in various parts of Nigeria. Fagbule et al.[21,17] reported that less than one–fifth of students are aware of HPV vaccine. Oluwole et al.[16] reported that while about one-quarter of undergraduate females in Lagos are aware of HPV vaccine, only 2.6% had received at least one dose of HPV vaccine. In Nigeria, two studies conducted among female students in Benin (South-south Nigeria) and adolescents in Ibadan (South-west, Nigeria) reported that only about 0.44%, 3.7% and 4.1% of the respondents have received HPV vaccines[17,22-23], while a study conducted among medical students in India reported a 6.8% uptake of HPV vaccine.[24] Another study conducted in Lagos slums, reported that no participant had ever gone for screening or was aware of cervical cancer screening methods[25] while only 2 (0.7%) of women interviewed in South West, Nigeria had undergone cervical cancer screening.[26]

Contrary to the findings of this study, a higher level of uptake of cervical cancer screening and HPV vaccination has been reported from developed nations such as Britain where 90.0% of women had been screened for the disease[27], 62.4% had received HPV vaccine in the United States, and 53% had received the vaccine in Germany.[28,29] This shows that the uptake of HPV vaccination and cervical cancer screening differs worldwide, with uptake higher in developed nations than in developing nations. Oluwole et al., attributes this discrepancy in the level of uptake of HPV vaccine between developed and developing nations to the availability of vaccination subsidy in these developed nations. [16]

Despite the low level of screening and vaccination reported in this study, slightly above half of the respondents agree that vaccination helps in the prevention of cervical cancer, and three-fifths and above half of the females are willing to go for screening and vaccination respectively. This finding is similar to the report of Oluwole et al.[16,30] Furthermore, two-fifths of the male respondents are willing to receive the vaccine or recommend it.

Table 5: Attitude towards cervical cancer and its prevention methods

Variable	Frequency	Percentage
Screening is helpful to detect cervical cancer early (agree)	338	70.6
Everyone is at risk of contracting HPV infection (agree)	183	38.2
Vaccination will help in the prevention of cervical cancer (agree)	254	53.0
Would consider vaccinating your children/ recommend the HPV vaccine (agree)	214	44.7
Would attend a cervical cancer health education program (agree)	331	69.1
Would want to be screened for cervical cancer (n = 363) * (agree)	232	63.9
Would want to receive the vaccine or recommend it (n = 363) * (agree)	196	53.9
You have a role to play in cervical cancer infection (n = 116) ** (agree)	43	37.1
Would want to receive the vaccine or recommend it (n =116) ** (agree)	48	41.4

*Female respondents only, **Male respondents only

Table 6: Predictors of knowledge of cervical cancer and its prevention methods

Factor	B	S.E.	OR (Exp B)	95% (Confidence interval)		*p*-value
				Min.	Max.	
Age						
< 18			1			
18 – 22	-1.140	0.603	0.320	0.098	1.043	0.059
23 – 27	-0.363	0.692	0.695	0.179	2.697	0.599
28 – 32	2.301	1.419	9.988	0.618	161.291	0.105
Level						
100			1			
200	0.396	0.503	1.485	0.554	3.978	0.431
400	2.295	0.560	9.923	3.308	29.765	<0.001
500	2.070	0.931	7.927	1.278	49.157	0.026
Faculty						
Basic Medical Sciences						
Clinical Medicine	-2.32	0.552	0.793	0.269	2.338	0.674
Management Science	-.299	0.878	0.050	0.009	0.279	0.001
Arts and Humanities	-21.09	6117	0.001	0.000	-	0.997
Agriculture	-1.706	0.581	0.182	0.058	0.567	0.003
Education	-3.828	1.071	0.022	0.003	0.177	<0.001
Pharmacy	-1.041	0.593	0.353	0.110	1.130	0.079
Science	-1.595	0.533	0.203	0.071	0.577	0.003
Social science	-2.820	0.670	0.060	0.016	0.222	<0.000

CONCLUSION

This study has shown a poor level of knowledge of cervical cancer and its prevention methods despite a high awareness level, and low level of uptake of cervical cancer screening and vaccination. Age, level of study and faculty (course of study) were factors significantly associated with knowledge of cervical cancer and its prevention methods. Lack of information is the most predominant reason why respondents hadn't been screened or vaccinated, and most of the respondents are willing to screen, vaccinate and recommend it.

This study adds to the existing knowledge by assessing the level of awareness, knowledge, and attitudes towards cervical cancer and its preventive measures among university students. The findings highlight the need for targeted health education programs to improve knowledge and promote preventive practices among young adults in Nigeria. Further research is needed to explore effective strategies for increasing knowledge and promoting preventive behaviours in this population.

Limitations: This study focuses on undergraduate students of Delta State University which may limit generalizability to other populations.

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Authors Contributions: DEB, NMI and ANS conceptualized the study. ANS, DEB, AHO and PO designed the methodology and study instrument. DEB collected the data, DEB, EIM and ANS analysed the data. All authors developed, read, and approved the manuscript.

Table 7: Practice towards cervical cancer screening and vaccination

Variable	Frequency	Percentage
I received a cervical cancer vaccine		
Yes	6	1.3
No	473	98.7
Reasons for not vaccinating*		
I am healthy	134	28.0
I'm not informed about where to get vaccinated	128	26.7
Never heard of it	106	22.1
Not aware it's for both gender	37	7.7
Financial constraint	36	7.5
No interest	35	7.3
I feel shy	20	4.2
It may be painful	15	3.1
Cultural/religious belief	10	2.1
Women affair	8	1.7
Partner won't allow	5	1.0
Nil	78	16.3
I screened for cervical cancer (n = 363)		
Yes	3	0.8
No	358	99.2
Screening test used		
Pap smear	2	75.0
VIA	1	25.0
Reason(s) for not screening* (n=360)		
Never heard of it	111	30.8
I'm not informed about screening place	87	24.2
I am healthy	74	20.6
Financial constraint	26	7.2
No interest	20	5.6
Cultural/religious belief	12	3.3
It may be painful	8	2.2
I feel shy	6	1.7
Partner will not allow	2	0.6
Nil	76	21.1

***Multiple response**

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